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Palaeo-ecology, switches, competition/disturbance and ancient forests

Wilson, J. Bastow[1]; White, Peter S.[2]; Bakker, Jan P.[3] & Díaz, Sandra[4]

[1]Botany Department, University of Otago, P.O. Box 56, Dunedin, New Zealand; E-mail bastow@bastow.ac.nz; [2]Department of Biology, University of North Carolina at Chapel Hill, NC 27599-3280, USA; E-mail peter.white@unc.edu; [3]Community and Conservation Ecology Group, University of Groningen P.O. Box 14, 9750, AA Haren, The Netherlands; E-mail j.p.bakker@biol.rug.nl; [4]Instituto Multidisciplinario de Biología Vegetal, Universidad Nacional de Córdoba, Casilla de Correo, RA-5000, Córdoba, Argentina; E-mail sdiaz@com.uncor.edu

Editors' Award 2004

This year's Editors' Award, for the paper in the *Journal of Vegetation Science* that impressed them the most, goes to Barboni et al. (2004): 'Relationships between plant traits and climate in the Mediterranean region: a pollen data analysis', which correlates the functional traits of plants with the climate in which they are growing. Many vegetation scientists are now interested in describing vegetation by the characteristics of the plants, as a complementary approach to description by taxonomic species (Díaz et al. 2004). This approach allows general patterns to emerge across areas that have largely distinct florae. To date, most correlations have been between functional traits and disturbance regime. The most obvious correlations to seek would be with climate, but climate varies over a broad geographic range, and comparable data on the distribution of species over such a range are difficult to obtain. Barboni et al. (2004) solved this problem by using the modern pollen rain to measure plant distributions. Pollen data are available for many, well-distributed sites, and relative abundance is routinely measured. They obtained data for 455 pollen taxa at 602 sites. Some of the correlations they found document what vegetation scientists would have supposed: trees are more abundant when water is more available, and the needle-leaved and evergreen ones are more abundant in colder climates. However, the absence of climatic correlations within their Mediterranean area for such life forms as mosses and cactoids are interesting. Several other traits did show correlations with temperature and/or moisture, including leaf size, leaf texture, wax on the cuticles and photosynthetic stems. This approach will allow an improvement over previous plant functional type (PFT) approaches, by highlighting the characters that seem to be adaptive in that their distribution is correlated with the climate.

Other papers receiving the Editors' commendation

The Editors would also like to commend the three runners-up: Alftine & Malanson (2004), Verheyen & Hermy (2004) and Lenssen et al. (2004).

Vegetation scientists have realized for over a century that almost all organisms modify their environment. Clements (1916) referred to this as 'reaction', and Braun-Blanquet (1932) as 'constructiveness'. Animal ecologists have now realised this, and have invented new terms such as 'niche construction' and 'ecological engineering'. [If plant ecologists often ignore excellent work from the early decades of plant ecology (Keddy in press), animal ecologists ignore early plant ecology much more consistently.] If the direction of this environmental change is one that favours the organism that makes it, there is positive feedback – a switch between two alternative states (Wilson & Agnew 1992). At least, there should be. Documenting the whole process has proved to be very difficult. George Malanson and his research group have for some time been investigating spatial patterns, ecotones, treelines and the processes that cause them. Now Alftine & Malanson (2004) have brought these ideas together in a spatial model of the alpine treeline. A model is only a hypothesis, and like a hypothesis can never be proved correct. However, Alftine & Malanson demonstrated that their model could produce patterns similar to those observed in the field, and only if a directional feedback mechanism was included, such as shelter by upwind trees – strong evidence that feedback is critical to formation of the pattern.

Ancient woodland species have been a long-standing puzzle in vegetation science. These are species that are frequent in forests that have never been cleared for other land-uses such as agriculture, but do not appear when a new wood is planted, sometimes staying absent for centuries (Rackham 1990). Do they require some special environmental conditions that are found only in ancient woods? Or would they be perfectly capable of growing in recent woods, but cannot disperse there? Verheyen & Hermy (2004) tested the environmental-conditions hypothesis by taking two species restricted to ancient woods and two widespread species, and sowing/planting them into ancient and recent woodland sites. A randomised split-plot design was used, with objective recording (counting) of the experimental responses.

There were differences in seedling survival, in the effect of vegetation cover, and in response to nutrient enrichment. However, those differences cut right across the ancient-wood / widespread species divide. Thus, there was no evidence for environmental limitation. Dispersal limitation is left as the likely explanation.

Vegetation is in need of theories. Well, perhaps it is not short of theories – what it is short of is theories that have been tested, and thus have some support in the real world. We have known since the pioneering and superb work of Clements et al. (1929 and earlier) that competition plays a vital rôle in structuring vegetation. For the past 30 years, we have realised that disturbance is not an occasional, nuisance phenomenon, but a constant feature and cause of vegetation. Competition and disturbance have been brought together in several theories, most famously in the predictions of Grime (1979) that competition will be less intense in disturbed habitats, and the species of disturbed habitats will be weaker competitors. Lenssen et al. (2004) tested these theories, applying flooding disturbance experimentally to microcosms, in a replicated, randomised design, and recording the response of the plants objectively using point quadrats. Held up against reality, the theories failed.

There are many manuscripts submitted to the Journal that do not make it through to acceptance. Some are returned to the authors at an early stage because their topic is quite outside the scope of *J. Veg. Sci.*. We also trap at that stage work that, whilst well executed, does not offer anything new that many of our readers would be interested in. However, once a paper gets through to an editor and to referees, the most common obstacle to publication seems to be invalid experimental or sampling design. Verheyen & Hermy (2004) and Lenssen et al. (2004) exemplify the well-conducted experiments that we are delighted to see.

Web site

The web pages of the *Journal of Vegetation Science* are hosted by the publishers: Opulus Press, who have recently revised and much improved their site. The pages are considerably faster to load, there is more content and navigation is easier.

The 'Instructions for Authors' are present as before, with special notes for Forum papers. A new feature is a list of the abbreviations of journal names to be used in the References. The Impact Factors for the last five years are available. The editorial staff will find new information specially for them. There is also the opportunity to sign up to be sent an e-mail when a new issue of *J. Veg. Sci.* is published on the web site. The message will contain the contents of the issue and other news. This facility was around before, but many people did not notice it, and it is now much easier to find.

There will always be at least one issue of the Journal available electronically for free to anyone. This will normally be the latest issue.

Other journals are on the same site, notably our sister journal *Applied Vegetation Science* and our good friends *Folia Geobotanica*. Opulus Press are open to suggestions for improvements to the site, which will be much easier to implement than previously.

Acknowledgements. Dr. Janet Franklin was co-ordinating editor for the paper winning the Editors' Award. Díaz et al. (2004) was nominated for the Award, but was ineligible because the senior author was one of the Chief Editors. We thank Joost van der Maarel, of Opulus Press, for responding to suggestions for improvements to their web site.

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